Updates from WAPA prepared for

Mid-West Electric Consumers Association
Water and Power Planning Committee Meeting

February 1, 2018

Rodney Bailey, Power Marketing Advisor
Jody Sundsted, SVP and UGP Regional Manager
Chris Lyles, Asset Management Specialist

Denver, Colorado

Western Area
Power Administration

PRS SOFTWARE
Update and UII Demo

Rodney Bailey
Power Marketing Advisor

Western Area Power Administration

Project Purpose

Replace the current Power Repayment Study (PRS) software to one reliable WAPA-wide PRS platform

- Save time
- Save cost
- Focus on analysis
- Consistent with Strategic Roadmap 2024
- Improvement of transparency per DOE reporting

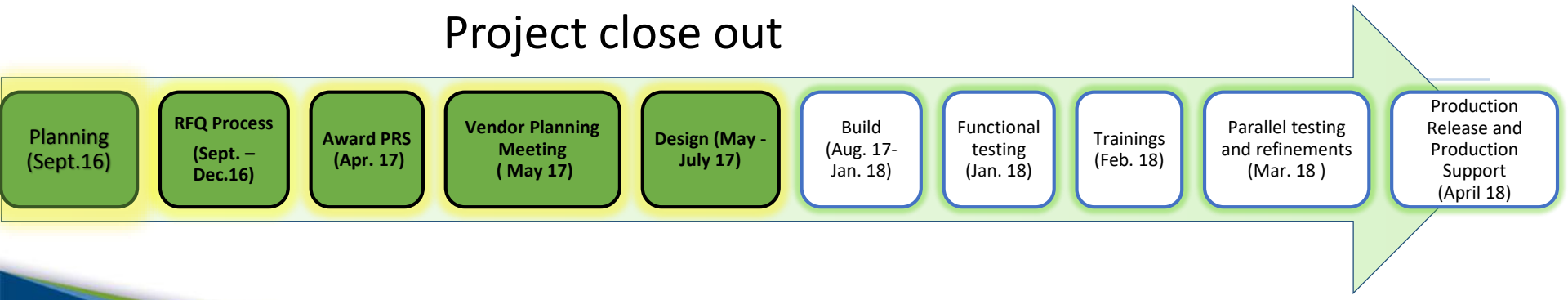
Project Goals

- WAPA-wide single platform
- Compliant with DOE policies and WAPA PRS practices
- Transparent and auditable (no black-box)
- User-friendly navigation and analysis
- Report generator
- Flexible modelling capability with data-validation

Project Timeline

2017 to 2018

- April 2017- Award
- April to July 2017 – Design
- July 2017 to January 2018 – Build
- January to March 2018 - User testing, training
- April 2018 – COTS in Production
- Project close out

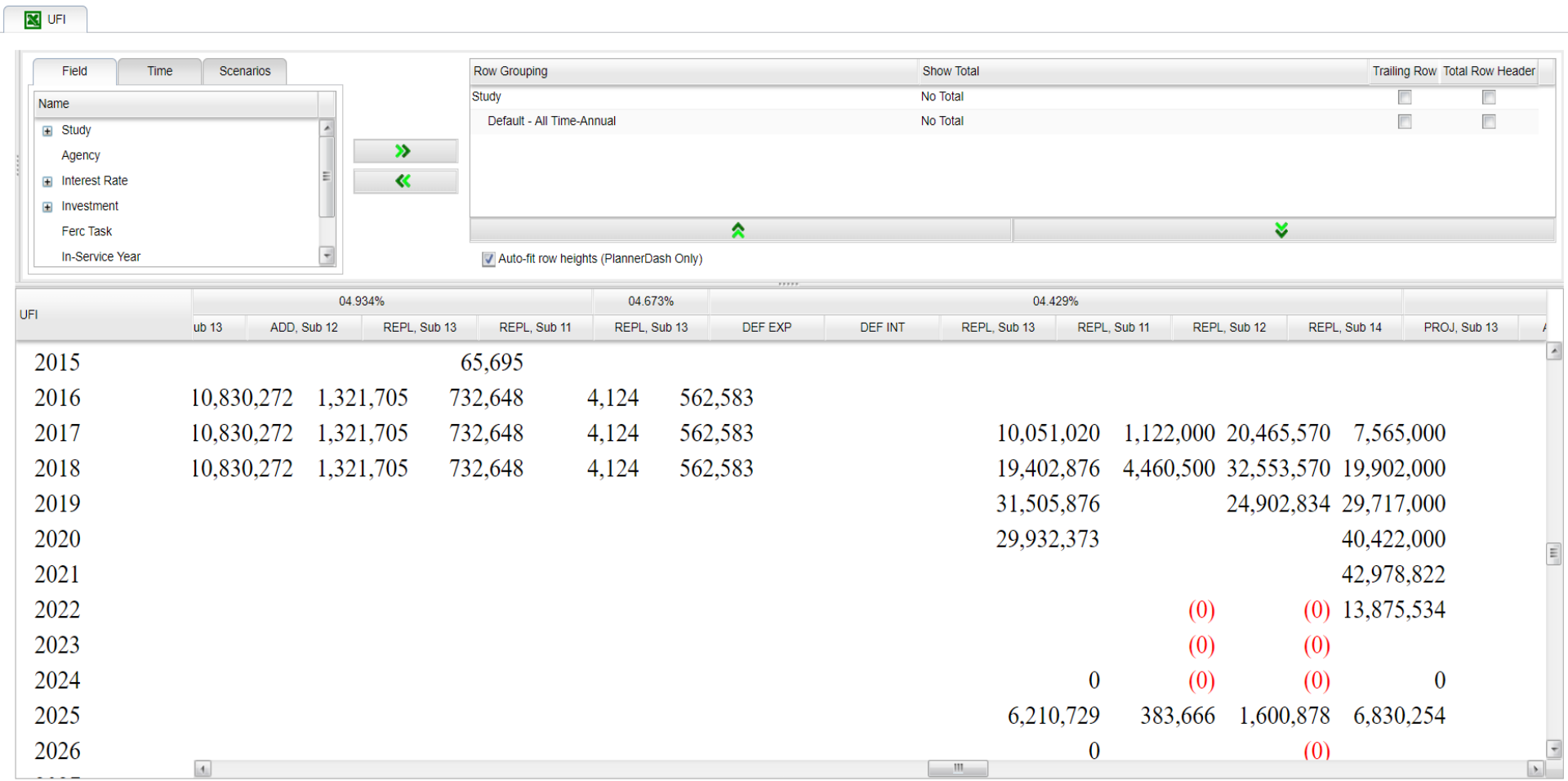


Executive Summary

Executive Summary Report

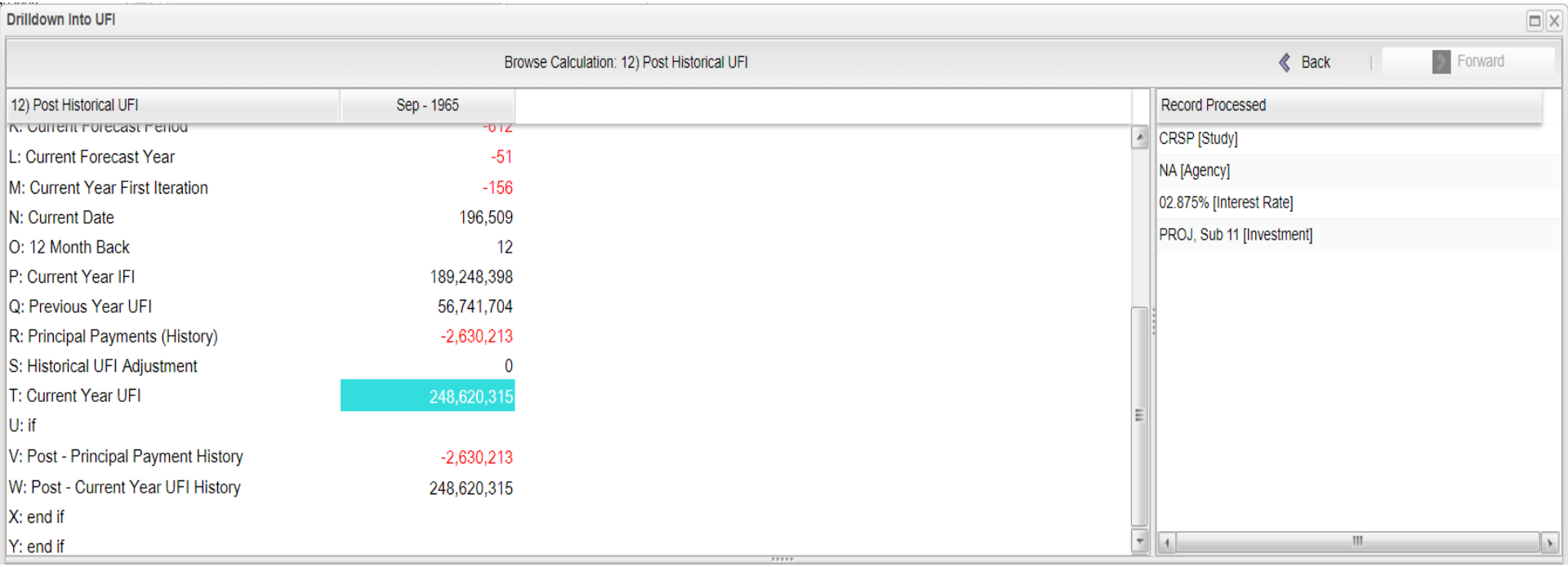
Line	History/Projection	Year		Expense					
			Total Rev	O & M Expense	Purchased Power Exp	Trans Serv Exp	Other Expense	Interest Exp	Total Exp
47	History	2009	166,710,021	64,775,812	32,090,240	11,454,441	2,701,000	23,655,065	134,676,
48	History	2010	181,500,287	71,843,691	26,420,413	10,446,428	1,902,218	18,192,828	128,805,
49	History	2011	212,641,508	74,390,212	37,376,035	9,996,428	(17,660,129)	13,578,117	117,680,
50	History	2012	189,884,240	77,648,355	32,782,870	9,979,334	11,013,043	5,836,997	137,260,
51	History	2013	187,313,302	69,639,970	66,289,501	9,115,093	(1,670,409)	(130,166,463)	13,207,
52	History	2014	190,581,922	74,159,845	78,036,697	6,333,111	26,676,754	26,782,199	211,988,
53	History	2015	209,184,288	78,354,197	37,659,105	9,276,728	6,311,790	2,417,900	134,019,
54	History	2016	187,552,739	78,792,765	19,644,620	7,264,215	11,530,060	4,238,768	121,470,
55	History	Sub-Total History	5,876,334,171	1,841,020,099	1,257,095,353	299,435,824	75,969,946	747,486,256	4,221,007,
56									
57	PYA Through	2016	1,104,003	47,471,481	5,841,091	(50)	(9,215,161)	21,949,820	66,047,
58	PYA Through	Sub-Total PYA Through	1,104,003	47,471,481	5,841,091	(50)	(9,215,161)	21,949,820	66,047,
59		HISTORICAL SUBTOTAL							
60									
61	Forecast	2017	186,392,118	82,134,204	15,267,758	10,292,757	13,621,447	7,402,418	128,718,
62	Forecast	2018	171,534,359	83,237,368	12,342,263	10,292,757	13,367,104	5,094,144	124,333,
63	Forecast	2019	171,679,193	86,740,214	12,342,263	10,292,757	13,367,604	4,250,649	126,993,
64	Forecast	2020	171,679,193	89,641,705	12,342,263	10,292,757	13,367,604	3,738,957	129,383,
65	Forecast	2021	171,799,875	90,879,734	4,000,000	10,292,757	13,367,604	2,780,729	121,320,

Sample Matrix – UFI



UFI	04.934%				04.673%	04.429%					
	ub 13	ADD, Sub 12	REPL, Sub 13	REPL, Sub 11	REPL, Sub 13	DEF EXP	DEF INT	REPL, Sub 13	REPL, Sub 11	REPL, Sub 12	REPL, Sub 14	PROJ, Sub 13
2015			65,695									
2016	10,830,272	1,321,705	732,648	4,124	562,583							
2017	10,830,272	1,321,705	732,648	4,124	562,583			10,051,020	1,122,000	20,465,570	7,565,000	
2018	10,830,272	1,321,705	732,648	4,124	562,583			19,402,876	4,460,500	32,553,570	19,902,000	
2019								31,505,876		24,902,834	29,717,000	
2020								29,932,373			40,422,000	
2021											42,978,822	
2022									(0)	(0)	13,875,534	
2023									(0)	(0)		
2024								0	(0)	(0)	0	
2025								6,210,729	383,666	1,600,878	6,830,254	
2026								0		(0)		

Drilldown

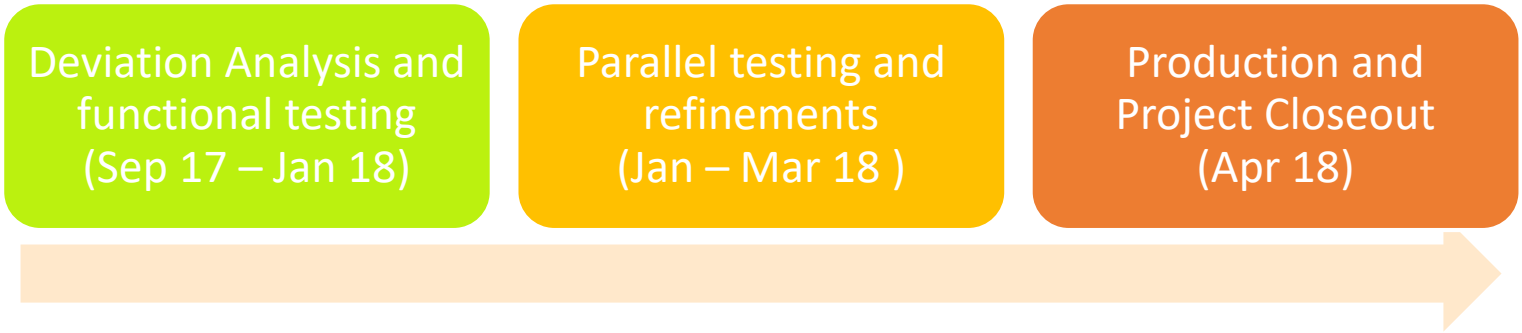

Drilldown Into UFI
Browse Calculation: 12) Post Historical UFI
Back
Forward
12) Post Historical UFI
Sep - 1965
L: Current Forecast Year
-51
M: Current Year First Iteration
-156
N: Current Date
196,509
O: 12 Month Back
12
P: Current Year IFI
189,248,398
Q: Previous Year UFI
56,741,704
R: Principal Payments (History)
-2,630,213
S: Historical UFI Adjustment
0
T: Current Year UFI
248,620,315
U: if
V: Post - Principal Payment History
-2,630,213
W: Post - Current Year UFI History
248,620,315
X: end if
Y: end if
Record Processed
CRSP [Study]
NA [Agency]
02.875% [Interest Rate]
PROJ, Sub 11 [Investment]

UI Planner Dash

- What if scenarios
  - Expenses/Revenues
  - Investments
  - Repayment
- Customer Portal
- Log in user ID
  - 10 licensing agreements
- Training

Next Steps Parallel Testing

- Validate against FY 2016 final studies
- Roll forward and parallel with FY 2017 studies
- Roll forward FY 2018 parallel
- Customer training
- Use new software for FY 2018 studies



Questions/Comments

Rodney Bailey
Power Marketing Advisor
801.524.4007
rbailey@wapa.gov

Pick-Sloan Missouri Basin Program

Jody Sundsted
SVP and UPG Regional Manager

Western Area Power Administration

Senate Energy and Water Development Staff Materials

Western Area Power Administration

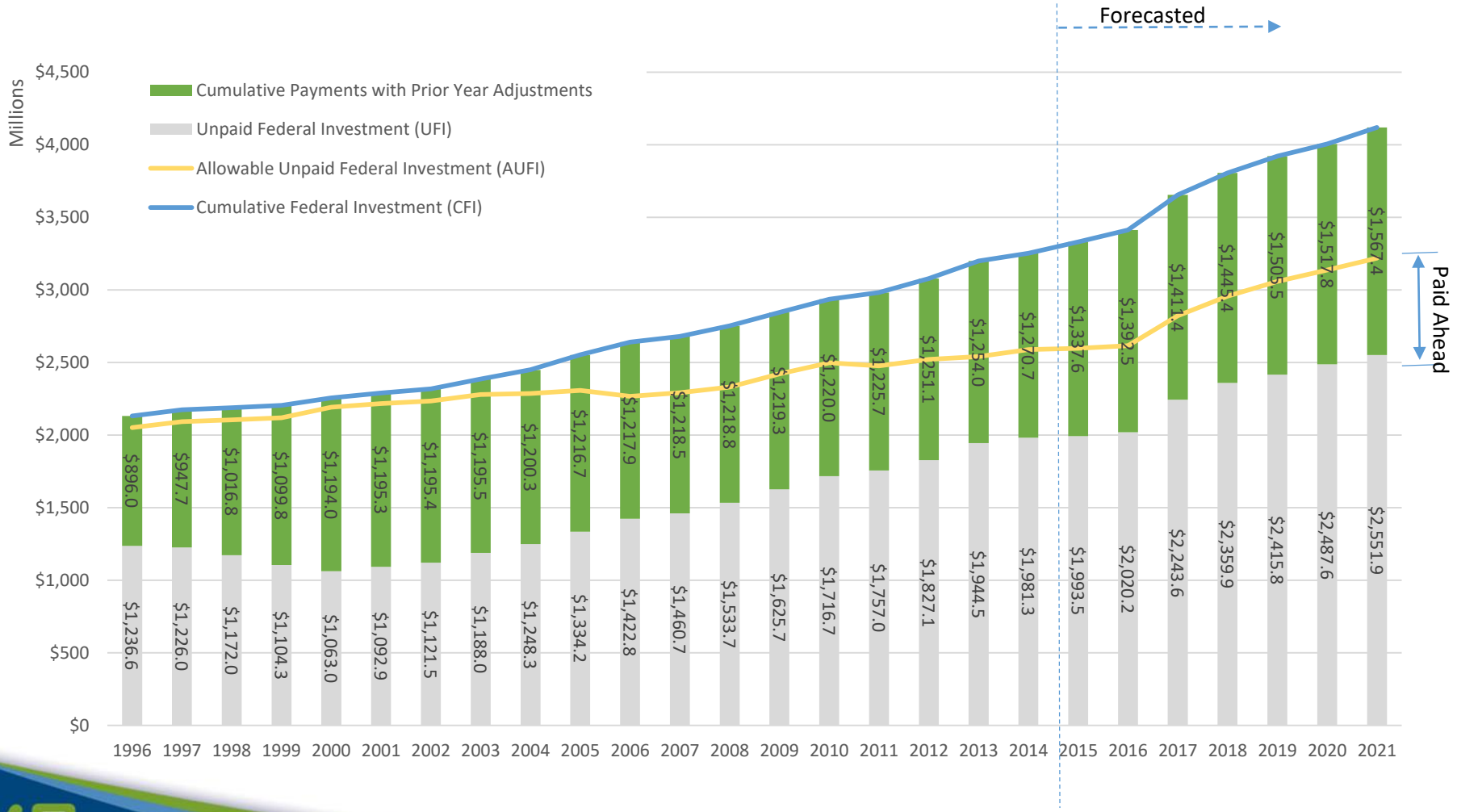
PPW "Scoring" – Background

- PPW unobligated reserve strategy
  - Developed jointly with Mid-West
  - Designed to navigate first 3 years of a drought
- Congressional budget office "scoring"
  - Reduced budget authority for FY18 to $179M
  - Coordinating with Senate Energy & Water
- Status
  - Submitted revised budget authority number for FY18 – $227M pending enacted budget
  - Senate Energy & Water taking lead with CBO for FY19

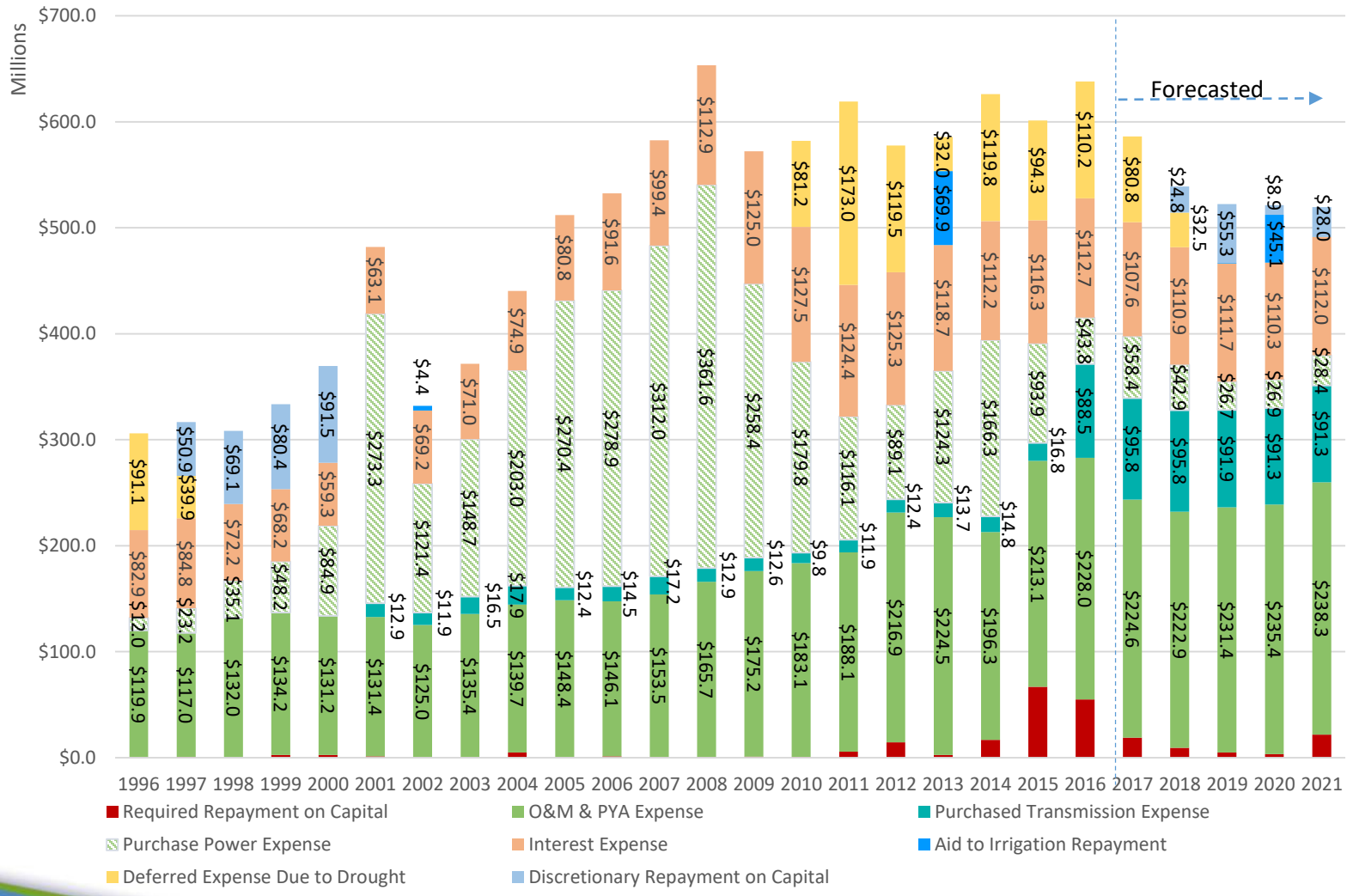
PPW “Scoring” – Potential Risks

- Power delivery to preference customers by ignoring extensive variability in hydropower and market pricing
- Power rate stability by shifting to less reliable/ higher cost funding sources
- Constrains/eliminates unobligated reserve strategy affecting capital financing during a drought
- Inability to firm power constrains ‘wide-spread use’ doctrine
- Inability to firm constrains repayment of federal investment in hydropower and irrigation

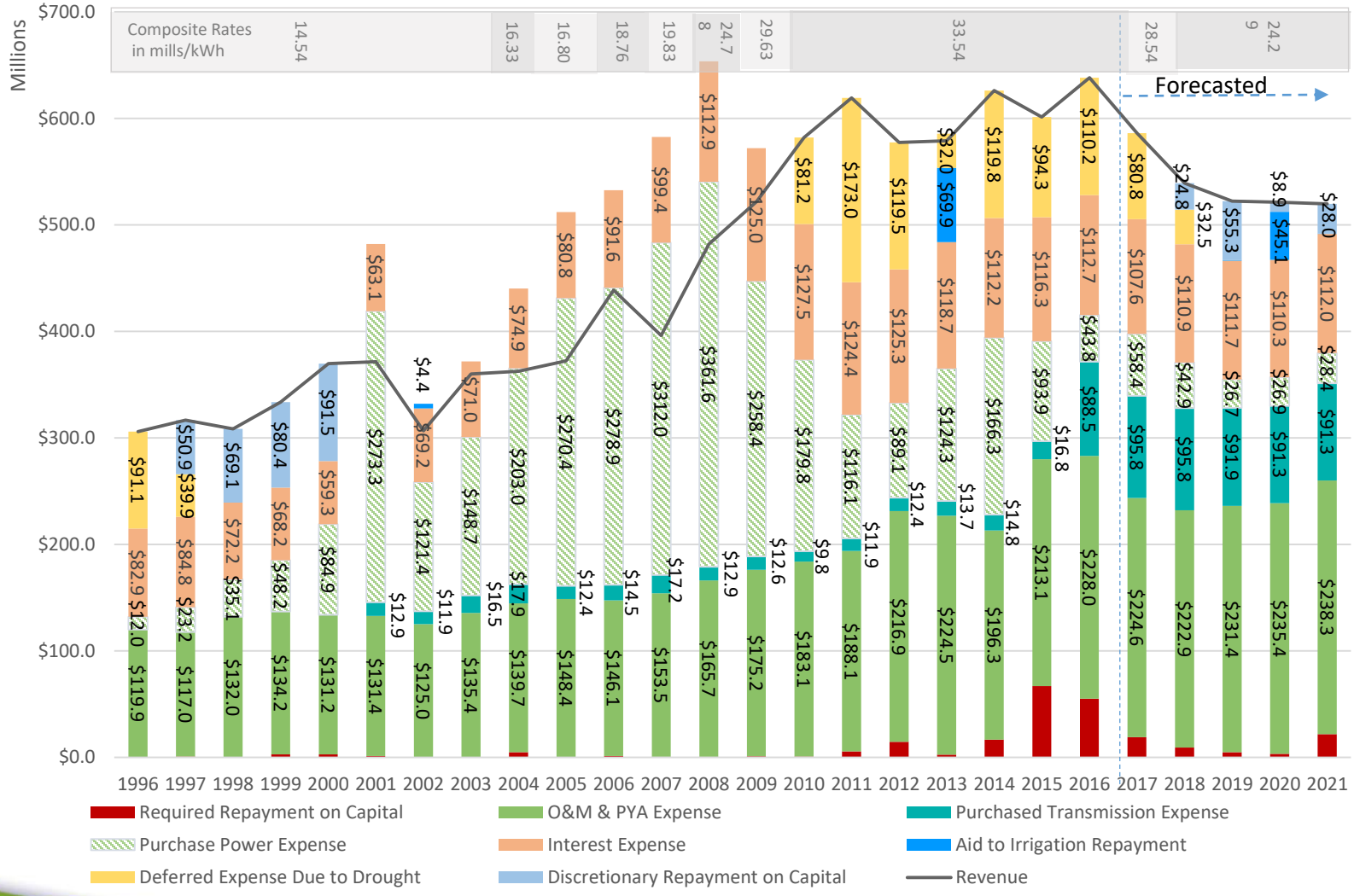
P-SMBP Capital Investments, Cumulative Payments, Unpaid Balances



Pick-Sloan Expenses, Repayment



Pick-Sloan Expenses, Repayment



UGP Resource Pool and PMI

Western Area Power Administration

P-SMBP — UGP
2021 New Customer Resource Pool

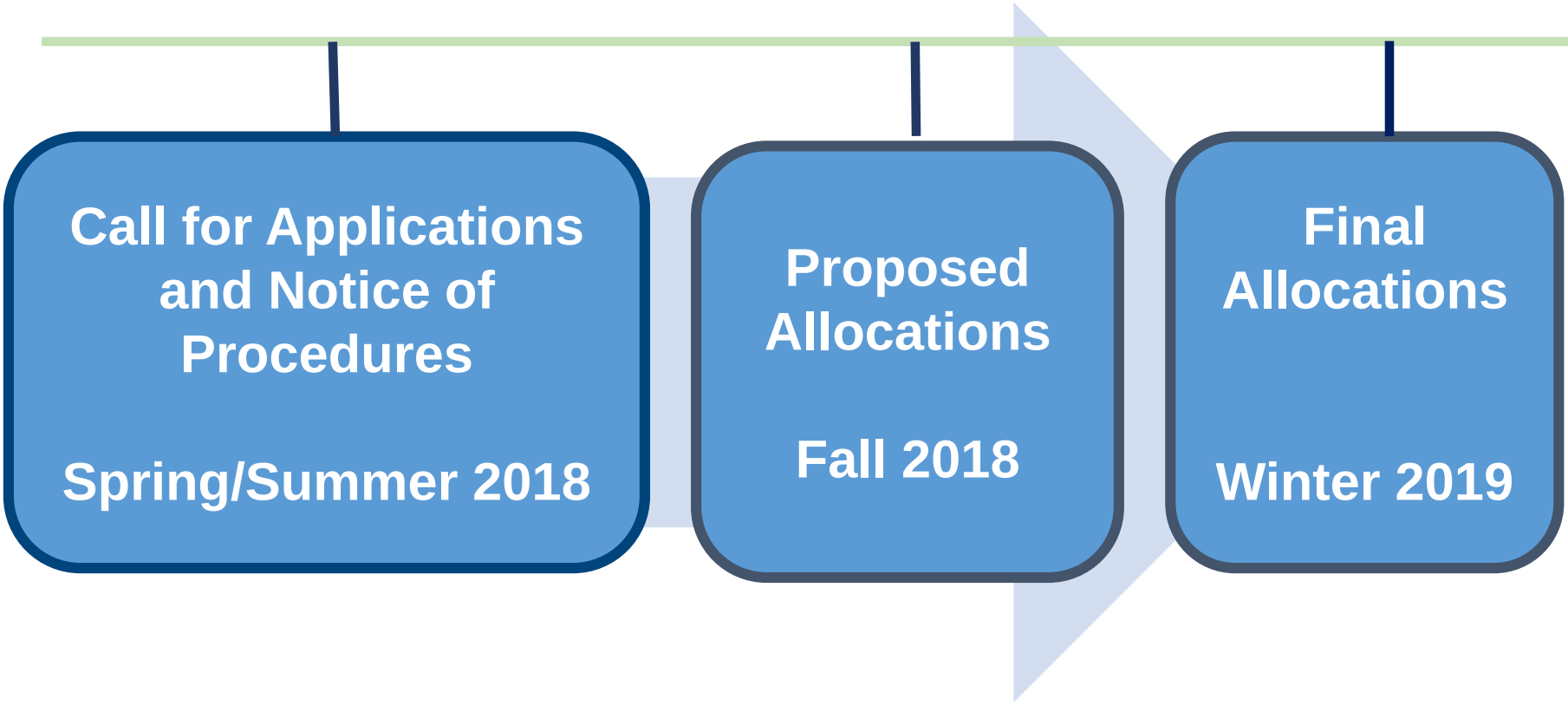
- **2021 Power Marketing Initiative (2021 PMI)**
  - Finalized Jan. 12, 2010, in the *Federal Register* notice

- **Action items under the 2021 PMI**
  - Existing customers sign 30-year Firm Electric Service contracts
    - Started in 2012 - present
  - New Customer Power Pools
    - 1 every 10 years beginning in 2021, 2031, & 2041

P-SMBP — UGP
2021 New Customer Resource Pool

- **2021 New Customer Resource Pool**
  - Pool Size
    - Up to 1 percent – approximately up to 20 MW
  - Carry forward Post-2010 Final Procedures
    - This means the same procedures as the last resource pool
    - Streamline the public process with 3 Federal Register notices
  - Public Process to begin in 2018

2021 New Customer Resource Pool



P-SMBP – UGP Region
2021 New Customer Resource Pool

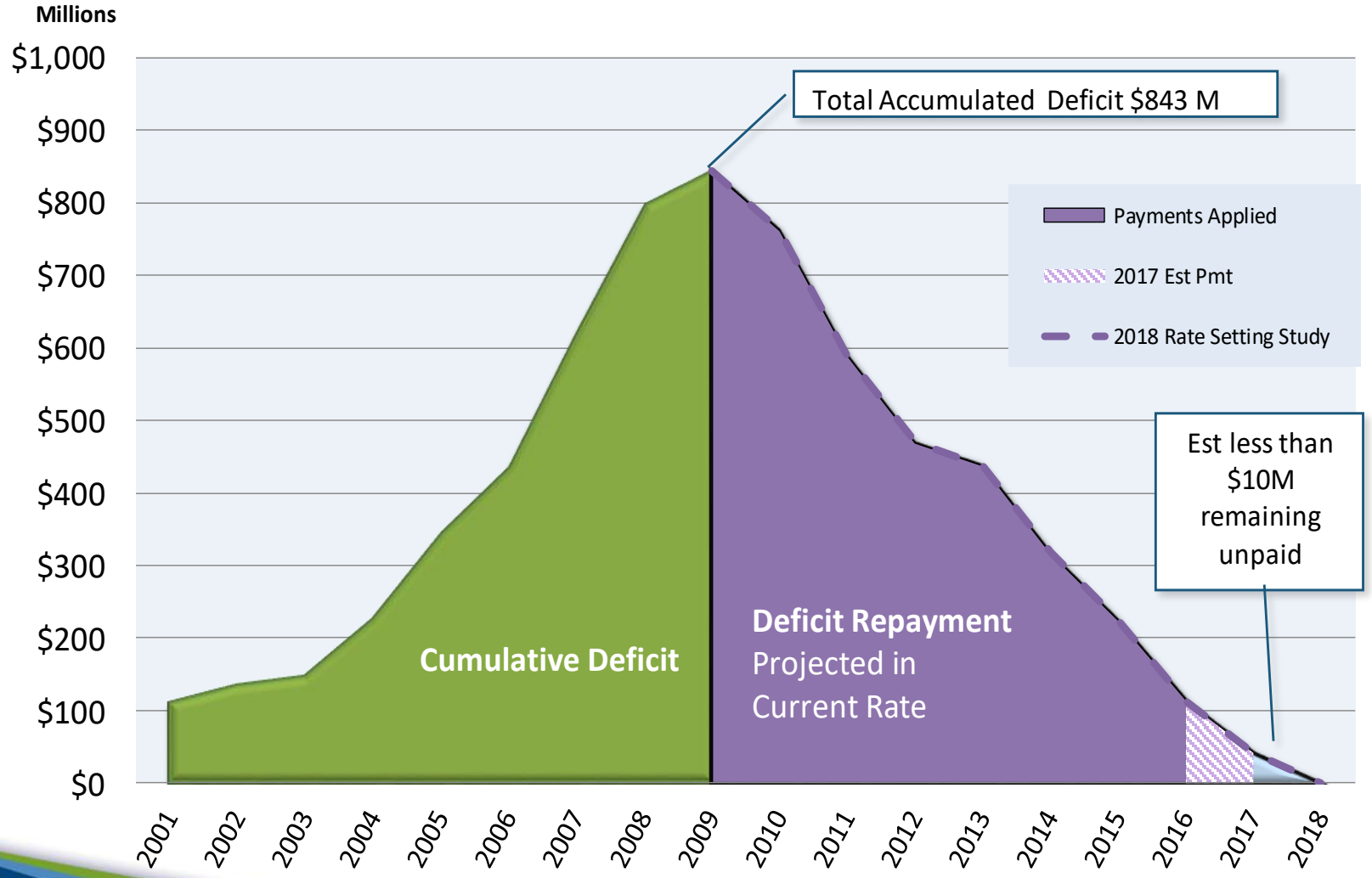
What to look for next

- FRNs
- Possible 2-year notice of potential withdrawal letter
  - Potential withdrawal in Contract Rates of Delivery (CROD) of up to 1% for new customers (~20 MW)
  - May not be needed if no new customers and FRN's completed before January 2019
- Firm Electric Service Contract Updates to Exhibits A, B & C
  - Potential reduction in CROD for new customers

Pick-Sloan PRS

Western Area Power Administration

2017 Prelim Deficit Repayment



New Rates (Effective Jan. 1, 2018)

Firm Power Service	Current Rates Effective January 1, 2017	Proposed Rates Effective January 1, 2018	% Change
P-SMBP-ED Revenue Requirement	$282.7 million	$230.1 million*	-19%
P-SMBP-ED Composite Rate	28.25 mills/kWh	24.00 mills/kWh	-15%
Firm Capacity	$6.50 kW-month	$5.25 kW-month	-19%
Firm Energy	16.18 mills/kWh	13.27 mills/kWh	-18%
Firm Peaking Capacity	$5.85 kW-month	$4.75 kW-month	-19%
Firm Peaking Energy 1/	16.18 mills/kWh	13.27 mills/kWh	-18%

P-SMBP 2017 Prelim PRS

- Effective 1/1/2018 to reflect the Drought-Adder component going to zero in 2018
- The pinch for the study is 2020—$45M Irrigation Aid Payment (Riverton)
- Based on draft financials, the drought costs are nearly repaid in 2017
  - est. less $10M outstanding
- Study solves at 24.29 mills/kwh
  - Drought debt paid off in 2018

Drought-adder schedule for 2018
(as detailed in the FRN)

- Finalize annual Power Repayment Study (Feb-March)
  - Determine if Base Rate and/or Drought Adder needs adjustment via formal rate adjustment
- Corp snowpack is final—new generation projections April 15th
- Perform preliminary review of Drought Adder early summer – notify customers of and estimated change to the rate
- Perform second review of Drought Adder in September
- Notify customers in October of Drought Adder change to be implemented January 2019

Questions

www.wapa.gov

The Source

Transformer Risk Strategy

Chris Lyles
Asset Management Specialist

Topics

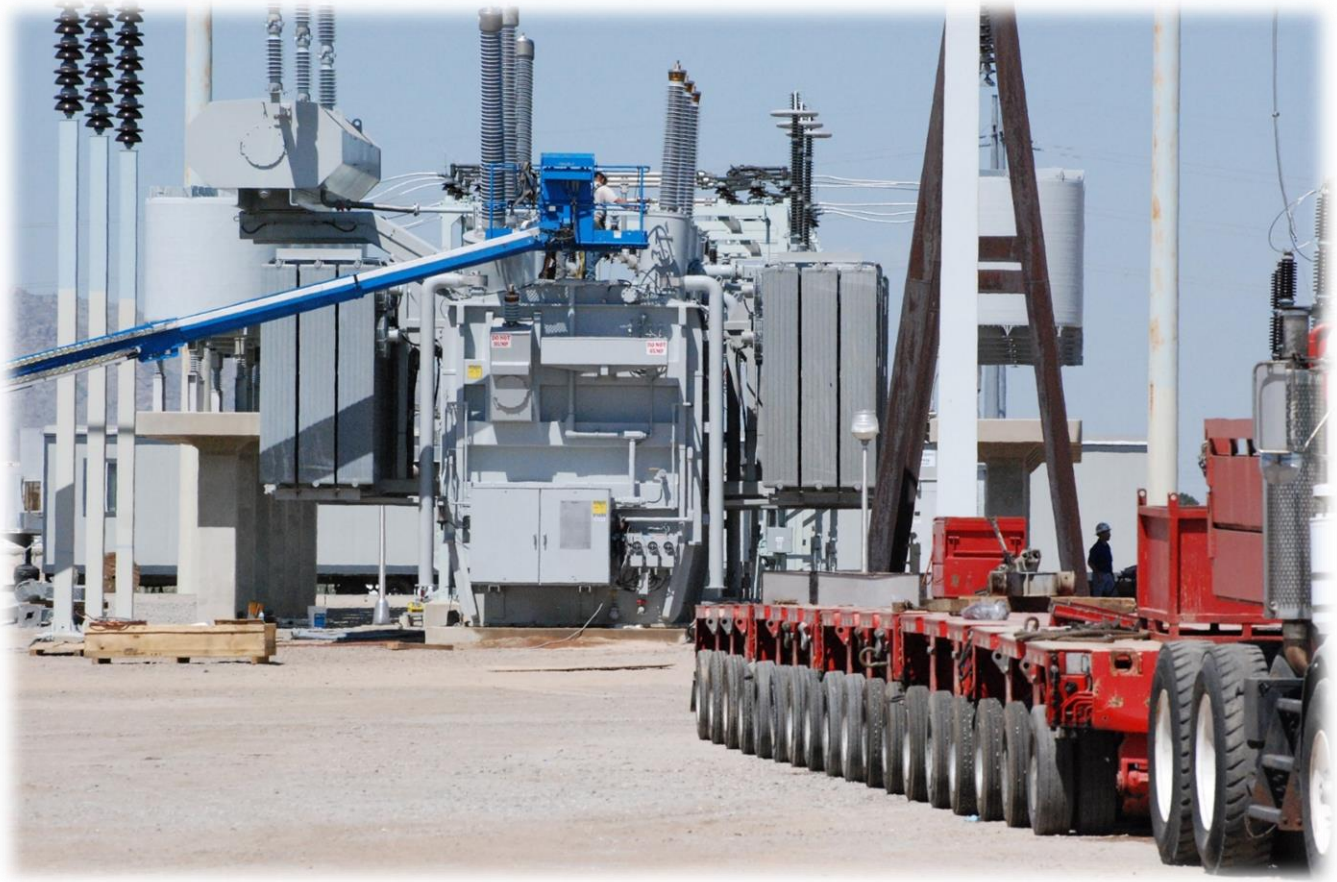
- Transformer spare need
- Objectives
- High-Impact Low-Frequency Events (HILF) and quantities
- Alternatives for evaluation
  - WAPA inventory
  - WAPA system robustness
  - Grid Assurance
- Customer feedback

Why are spare transformers needed?

- Reliability requirement to customers and the bulk electric system
- Unanticipated loss directly impacts the resiliency/reliability
- Acquisition lead time of 18-24 months
  - Require custom build
  - 100 tons, contain 25,000 gallons of oil
  - Transport requires specialized vehicles, permits, and task-specific crews

Typical WAPA large power transformer

Specialized transportation



Analysis objectives

- Alternatives for response to high-impact, low-frequency events resulting in loss of multiple transformers
- Solicit feedback from WAPA subject matter experts and WAPA customers
- Develop final recommendation incorporating customer feedback and regional expertise
- Analysis and subsequent report is a WAPA-wide strategy intended to produce a recommendation that most efficiently uses WAPA's entire fleet of transformer options

Event definition

- WAPA analysis
  - Define three high-impact low-frequency event types
  - Assume loss of all large power transformers within impacted site
- Local event
  - Event center at WAPA facility
  - Impacted sites are within 5-mile radius of center
  - All WAPA facilities could be center of event
- Seismic event
  - Event center at Tracy or Mead facility
  - Impacted sites are within 80-mile radius of center
- Targeted event
  - Event center at major population centers and military installations – 9 sites identified
  - Impacted sites are within 50-mile radius of center

Spares needed

Primary Voltage	Secondary Voltage	Type	Number of Spares
525kV	230kV	Single Phase	3
345kV	230kV	Three Phase	2
230kV	161kV	Three Phase	1
230kV	115kV	Three Phase	3
230kV	115kV	Single Phase	3
230kV	69kV	Three Phase	3

Why now?

- Threat of physical, calculated attacks
- Potential vulnerabilities in electrical utility industry
- Power systems operating closer to limits

Alternatives currently under evaluation

- WAPA warehoused alternative
- WAPA system enhancement alternative
- Grid Assurance alternative
- Hybrid alternative
- No action – status quo

Feedback

- **Todd Rhoades**
  720.962.7214
  rhoades@wapa.gov
- **John Quintana**
  720.962.7296
  quintana@wapa.gov